AMENDMENTS TO THE CLAIMS:

Claims 1-71 (cancelled)

72. (Previously presented) A method for mounting an electronic component, comprising:

forming a ball at a tip of a metal wire;

forming said ball into a bump by thermocompression bonding said ball to a first electrode of an electronic component;

shaping a tip of said bump without collapsing said bump by applying a load of not greater than 20 gf to said bump; and then

with an insulating resin layer, including a mixture of an insulating resin and an inorganic filler, interposed between said electronic component and a circuit board while said first electrode is aligned with a second electrode of said circuit board, bonding said electronic component to said circuit board by hardening said insulating resin layer such that said first electrode becomes electrically connected to said second electrode via said bump.

73. (Previously presented) The method according to claim 72, wherein

forming a ball at a tip of a metal wire comprises subjecting said metal wire to an electric spark.

74. (Previously presented) The method according to claim 73, wherein

thermocompression bonding said ball to a first electrode includes applying supersonic waves to said ball.

75. (Previously presented) The method according to claim 74, further comprising:

using a capillary to hold said metal wire while subjecting said metal wire to said electric spark, and while forming said ball into said bump.

76. (Currently Amended) The method according to claim 75, wherein

said insulating resin layer comprises a solid or semi-solid insulating resin layer, and

shaping a tip of said bump without collapsing said bump by applying a load of not greater than 20 gf to said bump comprises pressing said bump against said second electrode ~~without leveling said bump~~ while said solid or semi-solid insulating resin layer is interposed between said electronic component and said circuit board.

77. (Previously presented) The method according to claim 76, wherein

bonding said electronic component to said circuit board comprises using a tool to apply a pressure force, of at least 20 gf per bump, to said electronic component such that said bump is compressed.

78. (Previously presented) The method according to claim 77, wherein

bonding said electronic component to said circuit board further comprises applying heat to said insulating resin layer while using said tool to apply said pressure force to said electronic component.

79. (Previously presented) The method according to claim 78, wherein

applying heat to said insulating resin layer while using said tool to apply said pressure force to said electronic component results in any warpage of said circuit board being corrected.

80. (Previously presented) The method according to claim 79, wherein

applying heat to said insulating resin layer comprises applying heat to an electronic component side of said insulating resin layer, applying heat to a circuit board side of said insulating resin layer, or applying heat to an electronic component side and a circuit board side of said insulating resin layer.

Claim 81 (Cancelled)

82. (Previously presented) The method according to claim 80, wherein

said insulating resin comprises an insulative thermosetting epoxy resin, and an amount of said inorganic filler is from 5 to 90 weight percent of said insulative thermosetting epoxy resin.

83. (Previously presented) The method according to claim 80, wherein

said electronic component includes an additional first electrode, with an area being defined by edges of said first electrode and said additional first electrode,

said insulating resin layer comprises a solid insulating resin sheet having a surface area that is less than said area defined by said edges of said first electrode and said additional first electrode, and

said insulating resin layer is interposed between said electronic component and said circuit board by placing said solid insulating resin sheet onto said circuit board before aligning said first electrode with said second electrode of said circuit board.

84. (Previously presented) The method according to claim 83, wherein

said area defined by edges of said first electrode and said additional first electrode is an area defined by inner edges of said first electrode and said additional first electrode, and

placing said solid insulating resin sheet onto said circuit board comprises placing said solid insulating resin sheet onto said circuit board such that said solid insulating resin sheet is positioned within said area defined by said inner edges of said first electrode and said additional first electrode.

85. (Previously presented) The method according to claim 80, wherein

said wire comprises a gold wire, and

said capillary has an opening defined by a non-flat tip portion having a chamfer angle of at most 100°,

such that using a capillary to hold said metal wire while subjecting said metal wire to said electric spark and while forming said ball into said bump comprises using said capillary to hold said gold wire while subjecting said gold wire to said electric spark so as to form a gold ball at said opening and while forming said gold ball into a gold bump that has an approximately conically shaped tip by bringing said non-flat tip portion into contact with said gold ball.

86. (Previously presented) The method according to claim 80, wherein

said inorganic filler comprises a first type of inorganic filler and a second type of inorganic filler, with said first type of inorganic filler having a mean particle diameter that is different than a mean particle diameter of said second type of inorganic filler.

87. (Previously presented) The method according to claim 86, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a portion of said insulating resin layer contacts either said electronic component or said circuit board, with said portion having a smaller amount of said inorganic filler than does a remainder portion of said insulating resin layer.

88. (Previously presented) The method according to claim 86, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a first portion of said insulating resin layer contacts said electronic component and a second portion of said insulating resin layer contacts said circuit board, with said first portion having a different amount of said inorganic filler than does said second portion.

89. (Previously presented) The method according to claim 88, wherein

said first portion includes an insulating resin that improves adhesion to a film material used on a surface of said electronic component, and

said second portion includes an insulating resin that improves adhesion to a material used on a surface of said circuit board.

90. (Previously presented) The method according to claim 86, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a portion of said insulating resin layer contacts either said electronic component or said circuit board, with said portion having none of said inorganic filler therein.

91. (Previously presented) The method according to claim 80, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a portion of said insulating resin layer contacts either said electronic component or said circuit board, with said portion having a smaller amount of said inorganic filler than does a remainder portion of said insulating resin layer.

92. (Previously presented) The method according to claim 80, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a first portion of said insulating resin layer contacts said electronic component and a second portion of said insulating resin layer contacts said circuit board, with said first portion having a different amount of said inorganic filler than does said second portion.

93. (Previously presented) The method according to claim 91, wherein

said first portion includes an insulating resin that improves adhesion to a film material used on a surface of said electronic component, and

said second portion includes an insulating resin that improves adhesion to a material used on a surface of said circuit board.

94. (Previously presented) The method according to claim 80, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a first portion of said insulating resin layer contacts said electronic component and a second portion of said insulating resin layer contacts said circuit board, with said first portion including an insulating resin that improves adhesion to a film material used on a surface of said electronic component, and said second portion including an insulating resin that improves adhesion to a material used on a surface of said circuit board.

95. (Previously presented) The method according to claim 80, wherein

with said insulating resin layer interposed between said electronic component and said circuit board, a portion of said insulating resin layer contacts either said electronic component or said circuit board, with said portion having none of said inorganic filler therein.

96. (Previously presented) The method according to claim 80, wherein

said inorganic filler comprises spherical or pulverized silica or alumina.

Claim 97 (Cancelled)

98. (Currently amended) ~~The method according to claim 72, wherein~~

~~bonding said electronic component to said circuit board by hardening said insulating resin layer such that said first electrode becomes electrically connected to said second electrode comprises~~

A method for mounting an electronic component, comprising:

forming a ball at a tip of a metal wire;

forming said ball into a bump by thermocompression bonding said ball to a first electrode of an electronic component;

shaping a tip of said bump without collapsing said bump by applying a load of not greater than 20 gf to said bump; and then

with an insulating resin layer, including a mixture of an insulating resin and an inorganic filler, interposed between said electronic component and a circuit board while said first electrode is aligned with a second electrode of said circuit board,

(i) applying a first pressure to said electronic component while applying heat to said insulating resin, and then

(ii) while no longer applying said first pressure, applying a second pressure to said electronic component, with said second pressure being less than said first pressure,

thereby bonding said electronic component to said circuit board by hardening said insulating resin layer such that said first electrode becomes electrically connected to said second electrode via said bump.

99. (Previously presented) The method according to claim 98, wherein

said first pressure is not less than 20 gf per bump, and said second pressure is not greater than one half said first pressure.

100. (Previously presented) The method according to claim 72, wherein

bonding said electronic component to said circuit board includes applying supersonic waves to said bump.

101. (Previously presented) The method according to claim 72, wherein

said insulating resin layer is interposed between said electronic component and said board by applying said mixture of said insulating resin and inorganic filler, while in a liquid form, onto said circuit board before aligning said first electrode with said second electrode of said circuit board.

102. (Previously presented) The method according to claim 72, wherein

said insulating resin layer is interposed between said electronic component and said board by

(i) applying said mixture of said insulating resin and inorganic filler, while in a liquid form, onto said circuit board, and then

(ii) heating the liquid mixture in a furnace so as to partially solidify said mixture,

before aligning said first electrode with said second electrode of said circuit board.

103. (Previously presented) The method according to claim 72, wherein

a mean particle diameter of said inorganic filler is at least 3 μm.

104. (Previously presented) The method according to claim 72, wherein

said inorganic filler comprises a first type of inorganic filler and a second type of inorganic filler, with said first type of inorganic filler having a mean particle diameter that is at least twice as large as a mean particle diameter of said second type of inorganic filler.

105. (Previously presented) The method according to claim 72, wherein

said insulating resin layer comprises a first resin layer in contact with either said electronic component or said circuit board, and a second resin layer in contact with said first resin layer,

with said first resin layer including an insulating resin that is identical to said insulating resin of said mixture, and said second resin layer having an amount of said inorganic filler that is less than an amount of said inorganic filler in said first resin layer.

Claim 106 (Cancelled)

107. (Previously presented) The method according to claim 72, wherein

said inorganic filler comprises a first type of inorganic filler and a second type of inorganic filler, with said first type of inorganic filler having a mean particle diameter that is different than a mean particle diameter of said second type of inorganic filler.

Claim 108 (Cancelled)

109. (Previously presented) An apparatus for mounting an electronic component, comprising:

a device for forming a ball at a tip of a metal wire;

a device for forming the ball into a bump by thermocompression bonding the ball to a first electrode of an electronic component; and

a device for

(i) shaping a tip of the bump without collapsing the bump by applying a load of not greater than 20 gf to the bump, and then

(ii) with an insulating resin layer, including a mixture of an insulating resin and an inorganic filler, interposed between the electronic component and a circuit board while the first electrode is aligned with a second electrode of the circuit board, bonding the electronic component to the circuit board by hardening the insulating resin layer such that the first electrode becomes electrically connected to the second electrode via the bump.

110. (Previously presented) The apparatus according to claim 109, wherein

said device for forming a ball at a tip of a metal wire is for forming the ball by subjecting the metal wire to an electric spark.

111. (Previously presented) The apparatus according to claim 110, further comprising:

a capillary to hold the metal wire while subjecting the metal wire to the electric spark, and while forming the ball into the bump.

112. (Previously presented) The apparatus according to claim 111, wherein

said device for shaping a tip of the bump and bonding the electronic component to the circuit board comprises a tool for applying a pressure force, of at least 20 gf per bump, to the electronic component during bonding of the electronic component to the circuit board.

113. (Previously presented) The apparatus according to claim 112, further comprising:

a device for applying heat to the insulating resin layer while using said tool to apply the pressure force to the electronic component.

114. (Previously presented) The apparatus according to claim 113, wherein

said device for applying heat to the insulating resin layer, and said tool for applying the pressure force to the electronic component, results in any warpage of the circuit board being corrected when used to bond the electronic component to the circuit board.

115. (Previously presented) The apparatus according to claim 114, wherein

said device for forming the ball into a bump is for forming the ball into the bump by also applying supersonic waves to the ball.

116. (Currently Amended) The apparatus according to claim 115, wherein

the insulating resin layer comprises a solid or semi-solid insulating resin layer, and

said device for shaping a tip of the bump and bonding the electronic component to the circuit board is for shaping the tip of the bump by pressing the bump against the second electrode ~~without leveling the bump~~ while the solid or semi-solid insulating resin layer is interposed between the electronic component and the circuit board.

117. (Previously presented) The apparatus according to claim 116, further comprising:

a device for placing the solid or semi-solid insulating resin layer onto the circuit board or the electronic component such that the solid or semi-solid insulating resin layer becomes interposed between the electronic component and the circuit board.

118. (Previously presented) The apparatus according to claim 117, wherein

said capillary has an opening defined by a non-flat tip portion having a chamfer angle of at most 100°,

such that when said capillary is used to hold the metal wire while subjecting the metal wire to the electric spark and while forming the ball into the bump, said capillary holds the metal wire while subjecting the metal wire to the electric spark so as to form a metal ball at said opening and while forming the metal ball into a metal bump that has an approximately conically shaped tip by bringing said non-flat tip portion into contact with the metal ball.

119. (Previously presented) The apparatus according to claim 113, wherein

said device for applying heat to the insulating resin layer while using said tool to apply the pressure force to the electronic component comprises a heating device in said tool.

120. (Previously presented) The apparatus according to claim 119, further comprising:

a support for supporting the circuit board while said tool is applying the pressure force to the electronic component; and

a heating device, in said support, for applying heat to the insulating resin layer.

121. (Previously presented) The apparatus according to claim 113, further comprising:

a support for supporting the circuit board while said tool is applying the pressure force to the electronic component,

wherein said device for applying heat to the insulating resin layer while using said tool to apply the pressure force to the electronic component comprises a heating device in said support.

122. (Previously presented) The apparatus according to claim 109, wherein

said device for shaping a tip of the bump and bonding the electronic component to the circuit board comprises a device that is constructed and arranged to

(i) apply a first pressure to the electronic component while applying heat to the insulating resin, and then

(ii) while no longer applying the first pressure, apply a second pressure to the electronic component, with the second pressure being less than the first pressure,

during bonding of the electronic component to the circuit board.

123. (Previously presented) The apparatus according to claim 109, wherein

said device for shaping a tip of the bump and bonding the electronic component to the circuit board includes a device for applying supersonic waves to the bump.

124. (Previously presented) The apparatus according to claim 109, further comprising:

a furnace to heat a mixture of the insulating resin and inorganic filler, while in a liquid form and on the circuit board, so as to partially solidify the mixture before the first electrode is aligned with the second electrode of the circuit board.

125. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 72.

126. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 80.

127. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 98.

128. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 100.

129. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 101.

130. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 102.

131. (previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 103.

132. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 104.

133. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 105.

Claim 134 (Cancelled)

135. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 107.

136. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 82.

137. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 83.

138. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 85.

139. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 86.

140. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 91.

141. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 92.

142. (Previously presented) An electronic component unit comprising:

an electronic component mounted onto a circuit board, wherein said electronic component is mounted onto said circuit board by performing the method of claim 94.